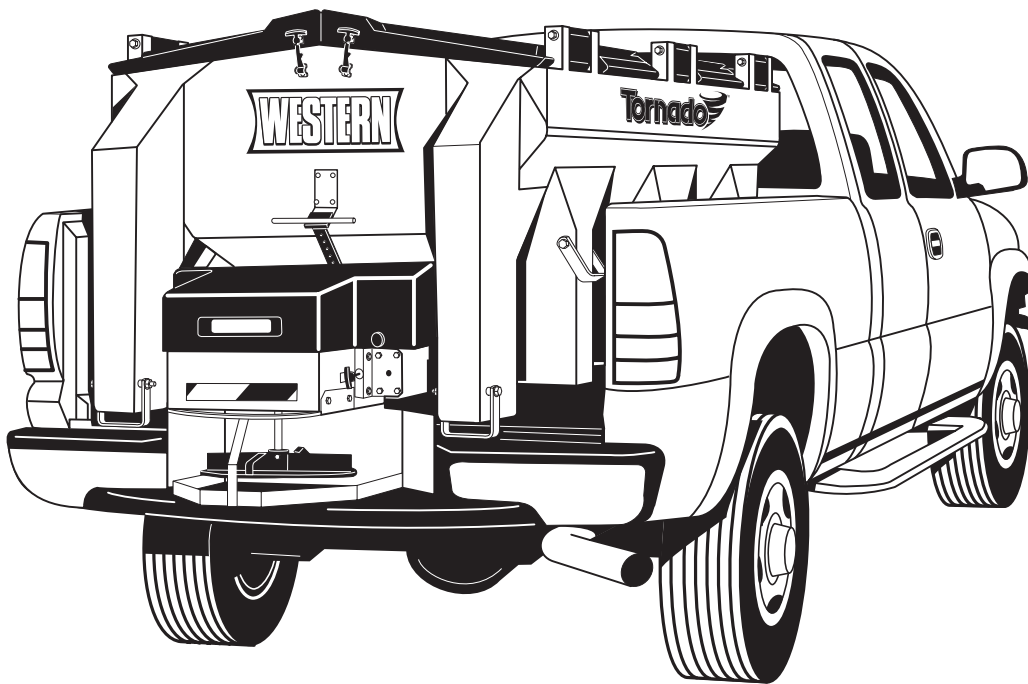




# Tornado™ Hopper Spreader

Owner's Manual  
*Original Instructions*



**⚠ CAUTION**

Read this document before operating  
or servicing the spreader.

This manual is for WESTERN® Tornado Hopper Spreaders with serial numbers  
beginning with 0607–0903.

**This manual supersedes all editions with an earlier date.**



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## PREFACE

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This manual has been prepared to acquaint you with the safety information, operation and maintenance of your new hopper spreader. Please read this manual carefully and follow all recommendations. This will help ensure profitable and trouble-free operation of your hopper spreader. Keep this manual accessible. It is a handy reference in case minor service is required.

When service is necessary, bring your hopper spreader to your distributor. They know your spreader best and are interested in your complete satisfaction.

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**NOTE: This spreader is designed to spread snow and ice control materials only. Do not use it for purposes other than those specified in this manual.**

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Register your spreader online at [www.westernplows.com](http://www.westernplows.com)

### OWNER'S INFORMATION

Owner's Name: \_\_\_\_\_

Date Purchased: \_\_\_\_\_

Outlet Name: \_\_\_\_\_ Phone: \_\_\_\_\_

Outlet Address: \_\_\_\_\_

Vehicle Model: \_\_\_\_\_ Year: \_\_\_\_\_

Spreader Type (Model): \_\_\_\_\_ Serial #: \_\_\_\_\_

Length: \_\_\_\_\_ Weight: \_\_\_\_\_ lb/kg: \_\_\_\_\_

# SAFETY

## SAFETY DEFINITIONS

### **WARNING**

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious personal injury.

### **CAUTION**

Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

**NOTE:** Indicates a situation or action that can lead to damage to your spreader and vehicle or other property. Other useful information can also be described.

## WARNING/CAUTION LABELS

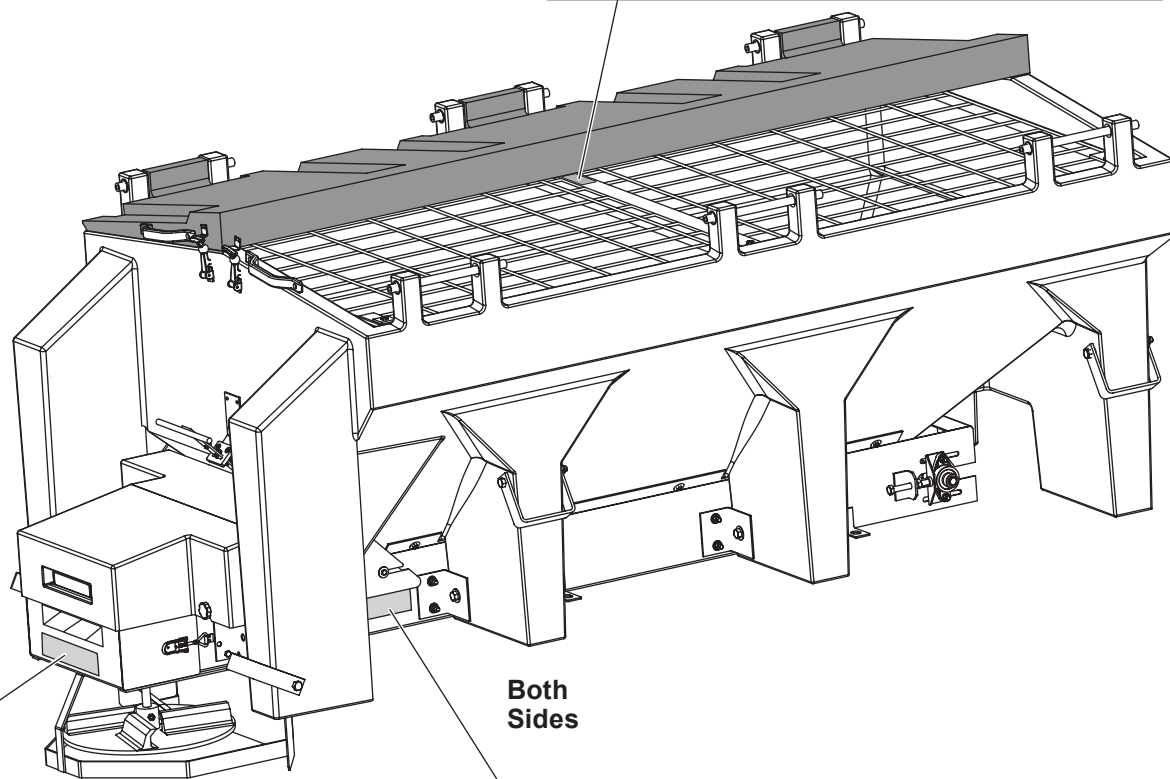
Become familiar with and inform users about the warning and caution labels on the spreader.

**NOTE:** If labels are missing or cannot be read, see your sales outlet.

### **CAUTION**

Do not lift spreader by this member. Lifting here could cause personal injury and property damage.

67272



Both  
Sides



### **WARNING**

- DO NOT exceed GVWR or GAWR with spreader and load.
- Turn spreader OFF before filling, adjusting or cleaning.
- Bystanders to stay a minimum of 25 feet away from operating spreader.
- DO NOT climb into or ride on spreader.
- Keep hands, feet and clothing away from moving conveyor and spinner.



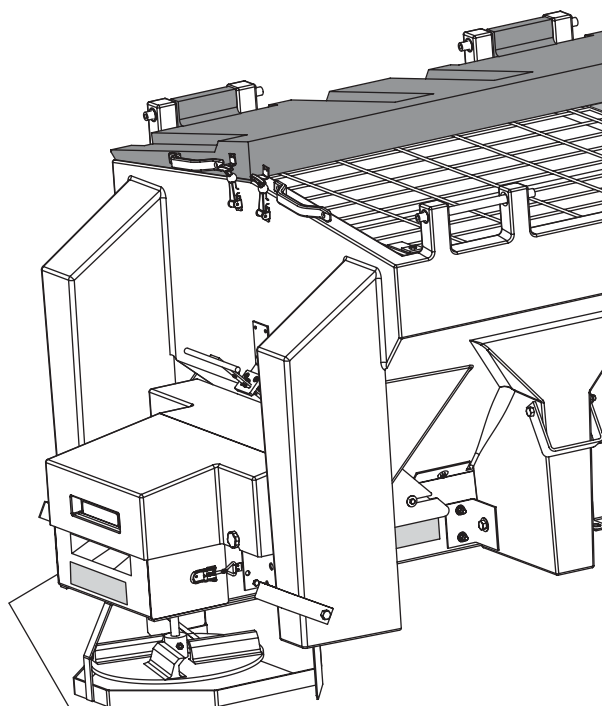
### **CAUTION**

- Read Owner's Manual before operating or servicing spreader.
- Empty and clean spreader after every use.

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# SAFETY

## SERIAL NUMBER LABEL



(Located on driver's side, next to warning/caution label.)

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

YYMMDDLXXXXZZZZZZ



Code	Definition
YY	2-Digit Year
MM	2-Digit Month
DD	2-Digit Day
LL	2-Digit Location Code
XXXX	4-Digit Sequential Number
ZZZZZZ	5- to 7-Digit Assembly PN

## SAFETY PRECAUTIONS

Improper installation and operation could cause personal injury and/or equipment and property damage. Read and understand labels and the Owner's Manual before installing, operating, or making adjustments.

### ⚠ WARNING

- Driver to keep bystanders minimum of 25 feet away from operating spreader.
- Before working with the spreader, secure all loose-fitting clothing and unrestrained hair.
- Before operating the spreader, verify that all safety guards are in place.
- Before servicing the spreader, wait for conveyor, auger, and spinner to stop.
- Do not climb into or ride on spreader.

### ⚠ WARNING



Overloading could result in an accident or damage. Do not exceed GVWR or GAWR ratings as found on the driver-side vehicle door cornerpost. See Loading section to determine maximum volumes of spreading material.

### ⚠ WARNING

Do not install the control for this product in the deployment path of an air bag. Refer to vehicle manufacturer's manual for air bag deployment area(s).

### ⚠ CAUTION

If rear directional, CHMSL light, or brake stoplights are obstructed by the spreader, the lights shall be relocated or auxiliary directional or brake stoplights shall be installed.

### ⚠ CAUTION

During the hopper installation we recommend the addition of an OSHA compliant Backup Alarm. This alarm is required for OSHA governed employers.

# SAFETY

## ⚠ CAUTION

- Do not operate a spreader in need of maintenance.
- Before operating the spreader, reassemble any parts or hardware removed for cleaning or adjusting.
- Before operating the spreader, remove materials such as cleaning rags, brushes, and hand tools from the spreader.
- Before operating the spreader, read the engine owner's manual, if so equipped.
- While operating the spreader, use auxiliary warning lights, except when prohibited by law.
- Tighten all fasteners according to the Torque Chart. Refer to Torque Chart for the recommended torque values.

## ⚠ CAUTION

Disconnect electric and/or hydraulic power and tag out if required before servicing or performing maintenance.

## ⚠ CAUTION



DO NOT leave unused material in hopper. Material can freeze or solidify, causing unit to not work properly. Empty and clean after each use.

**NOTE:** Lubricate grease fittings after each use. Use a good quality multipurpose grease.

## FUSES

The electrical system contains several blade-style automotive fuses. If a problem should occur and fuse replacement is necessary, the replacement fuse must be of the same type and amperage rating as the original. Installing a fuse with a higher rating can damage the system and could start a fire. Fuse Replacement, including fuse ratings and locations, is located in the Maintenance section of this Owner's Manual.

## PERSONAL SAFETY

- Remove ignition key and put the vehicle in park or in gear to prevent others from starting the vehicle during installation or service.
- Wear only snug-fitting clothing while working on your vehicle or spreader.
- Do not wear jewelry or a necktie, and secure long hair.
- Wear safety goggles to protect your eyes from battery acid, gasoline, dirt, and dust.
- Avoid touching hot surfaces such as the engine, radiator, hoses, and exhaust pipes.
- Always have a fire extinguisher rated BC handy, for flammable liquids and electrical fires.

## FIRE AND EXPLOSION

### ⚠ WARNING

Gasoline is highly flammable and gasoline vapor is explosive. Never smoke while working on vehicle. Keep all open flames away from gasoline tank and lines. Wipe up any spilled gasoline immediately.

Be careful when using gasoline. Do not use gasoline to clean parts. Store only in approved containers away from sources of heat or flame.

## CELL PHONES

A driver's first responsibility is the safe operation of the vehicle. The most important thing you can do to prevent a crash is to avoid distractions and pay attention to the road. Wait until it is safe to operate Mobile Communication Equipment such as cell phones, text messaging devices, pagers, or two-way radios.

# SAFETY

## VENTILATION

### ⚠ WARNING

Vehicle exhaust contains lethal fumes. Breathing these fumes, even in low concentrations, can cause death. Never operate a vehicle in an enclosed area without venting exhaust to the outside.

## BATTERY SAFETY

### ⚠ CAUTION

Batteries normally produce explosive gases which can cause personal injury. Therefore, do not allow flames, sparks, or lit tobacco to come near the battery. When charging or working near a battery, always cover your face and protect your eyes, and also provide ventilation.

- Batteries contain sulfuric acid, which burns skin, eyes, and clothing.
- Disconnect the battery before removing or replacing any electrical components.

## NOISE

Airborne noise emission during use is below 70 dB(A) for the spreader operator.

## VIBRATION

Operating spreader vibration does not exceed 2.5 m/s<sup>2</sup> to the hand-arm or 0.5 m/s<sup>2</sup> to the whole body.





## TORQUE CHART

### ⚠ CAUTION





Read instructions before assembling. Fasteners should be finger tight until instructed to tighten according to the Torque Chart. Use standard methods and practices when attaching spreader, including proper personal protective safety equipment.

### Recommended Fastener Torque Chart

#### Inch Fasteners Grade 5 and Grade 8

Size	Torque (ft-lb)		Size	Torque (ft-lb)	
	 Grade 5	 Grade 8		 Grade 5	 Grade 8
1/4-20	8.4	11.9	9/16-12	109	154
1/4-28	9.7	13.7	9/16-18	121	171
5/16-18	17.4	24.6	5/8-11	150	212
5/16-24	19.2	27.3	5/8-18	170	240
3/8-16	30.8	43.6	3/4-10	269	376
3/8-24	35.0	49.4	3/4-16	297	420
7/16-14	49.4	69.8	7/8-9	429	606
7/16-20	55.2	77.9	7/8-14	474	669
1/2-13	75.3	106.4	1-8	644	909
1/2-20	85.0	120.0	1-12	704	995

#### Metric Fasteners Class 8.8 and 10.9

Size	Torque (ft-lb)		Size	Torque (ft-lb)	
	 Class 8.8	 Class 10.9		 Class 8.8	 Class 10.9
M6 x 1.00	7.7	11.1	M20 x 2.50	325	450
M8 x 1.25	19.5	26.9	M22 x 2.50	428	613
M10 x 1.50	38.5	53.3	M24 x 3.00	562	778
M12 x 1.75	67	93	M27 x 3.00	796	1139
M14 x 2.00	107	148	M30 x 3.50	1117	1545
M16 x 2.00	167	231	M33 x 3.50	1468	2101
M18 x 2.50	222	318	M36 x 4.00	1952	2701

These torque values apply to fasteners except those noted in the instructions.



## LOADING

This Owner's Manual covers vehicles that have been recommended for carrying the hopper spreader. Please see your local dealer for proper vehicle applications.

### CERTIFICATION

#### ⚠ WARNING

New untitled vehicle installation of a spreader requires National Highway Traffic Safety Administration altered vehicle certification labeling. Installer to verify that struck load of snow or ice control material does not exceed GVWR or GAWR rating label and complies with FMVSS.

#### ⚠ WARNING

Overloading could result in an accident or damage. Do not exceed GVWR or GAWR as found on the driver-side cornerpost of vehicle.

#### ⚠ CAUTION



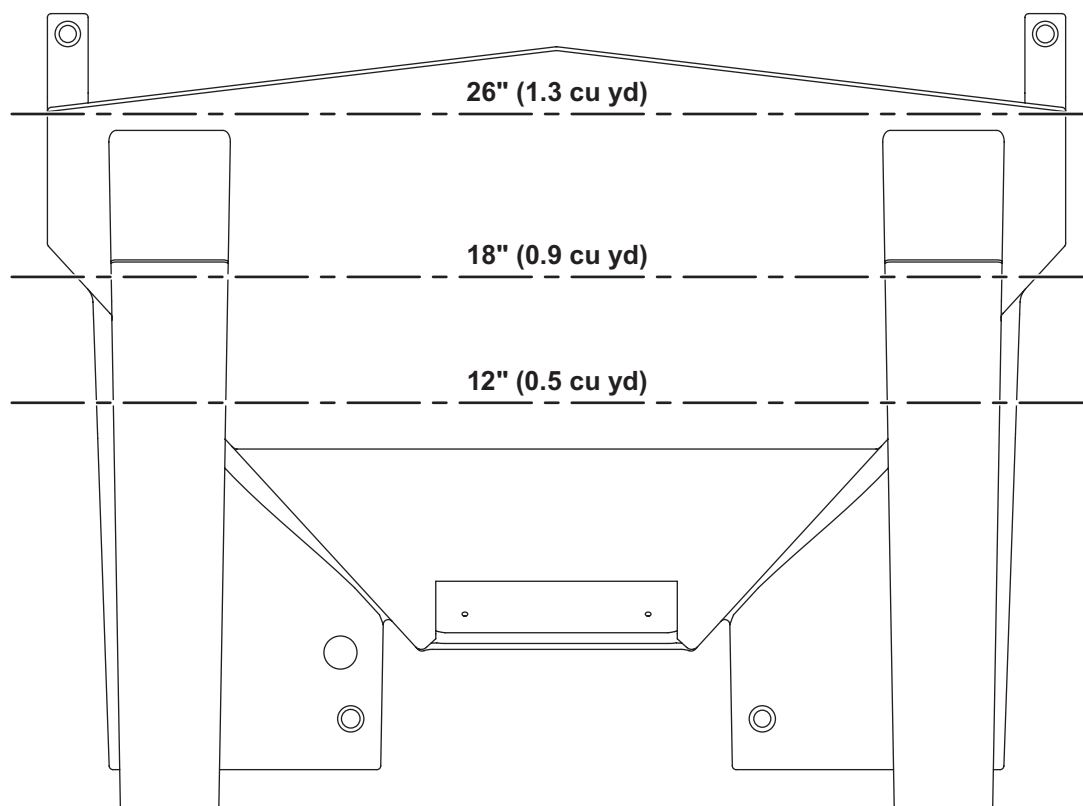
Read and adhere to manufacturer's ice-control material package labeling, including Material Safety Data Sheet requirements.

### MATERIAL WEIGHTS

Material	Density		
	(lb/ft <sup>3</sup> )	(lb/yd <sup>3</sup> )	(kg/m <sup>3</sup> )
Salt	80	2160	1282
Sand	100	2700	1602

Material densities are approximate and are based on dry, loose material. It is the responsibility of the operator to know the weight of the material to be spread and the vehicle carrying capacity.

### LOAD VOLUME



## LOADING

### SPREADER SPECIFICATIONS

Spreader Description	Overall Length (in)	Empty Weight (lb)	Capacity Struck (cu yd)	Capacity Rounded (cu yd)	Overall Width (in)	Overall Height (in)	Recommended Use
Regular Capacity 7' Hopper Body Double-Wall Poly	84	550	1.3	1.5	50	37	3/4–1 ton Pickup Trucks above 8500 lb GVWR

### DETERMINING VEHICLE PAYLOAD

#### WARNING

**Overloading could result in an accident or damage. Do not exceed GVWR or GAWR ratings as found on the driver-side door cornerpost of the vehicle. See Loading section to determine maximum volumes of spreading material.**

1. Install hopper spreader and optional equipment according to the instructions.
2. Install or attach any other equipment that will be on the vehicle while the hopper spreader will be in use (step bumper, trailer hitch, snowplows, etc.). Fill gas tanks.
3. Obtain the Gross Vehicle Weight Rating (GVWR), Front Gross Axle Weight Rating (FGAWR) and Rear Gross Axle Weight Rating (RGAWR) from the certification label located inside the driver-side door jamb or door.
4. With the occupants in the truck for normal hopper spreader operation, weigh the vehicle to obtain gross vehicle weight (GVW).
5. Subtract the GVW from the GVWR to determine the available material payload.
6. Obtain the weight per cubic yard (lb/cu yd) of the desired material. Divide the weight into the payload to determine the maximum volume of material that can be carried.
7. Compare the maximum volume to determine the maximum height of the material in the hopper spreader.
8. Fill hopper with the material to the calculated height. Re-weigh vehicle with occupants and verify that the GVW, Front Gross Axle Weight, and Rear Gross Axle Weight are less than the vehicle's ratings.
9. Repeat Steps 6–8 for each type of material.

Refer to the "Determining Vehicle Payload Worksheet" for an example and worksheet.

## LOADING

### Determining Vehicle Payload Worksheet

Material Type	Example: Dry Salt				
Equipment installed when vehicle was weighed	7' Poly Hopper Spreader				
Front Gross Axle Weight Rating (FGAWR) (lb)					
Rear Gross Axle Weight Rating (RGAWR) (lb)					
Gross Vehicle Weight Rating (GVWR) (lb)	8600				
Gross Vehicle Weight (empty) (lb)	– 6500				
Payload Available (lb)	= 2100				
Material Density (lb/cu yd)	÷ 2160				
Maximum Volume (cu yd)	= 0.97				
Maximum Height (approximate) (in)	18				
Loaded Front Gross Axle Weight (FGAW) (lb)					
Loaded Rear Gross Axle Weight (RGAW) (lb)					
Loaded Gross Vehicle Weight (GVW) (lb)					

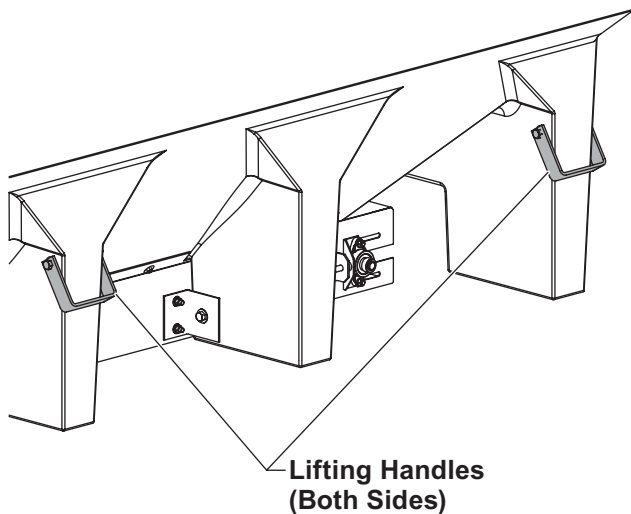
## MOUNTING THE SPREADER

**NOTE:** Periodically throughout the snow and ice control season, verify that mounting devices are secure.

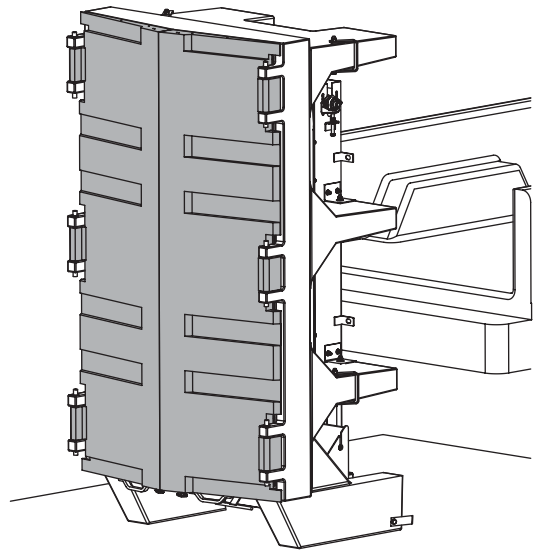
### **⚠ CAUTION**

Before lifting, verify that hopper is empty of material. The lifting device must be able to support the spreader's weight as shown in the spreader specifications table.

1. Remove the tailgate from the truck.
2. The spreader can be moved into the truck bed either by lifting the spreader by the four lifting handles located on the corner legs or by sliding the spreader into the truck bed from the ground.



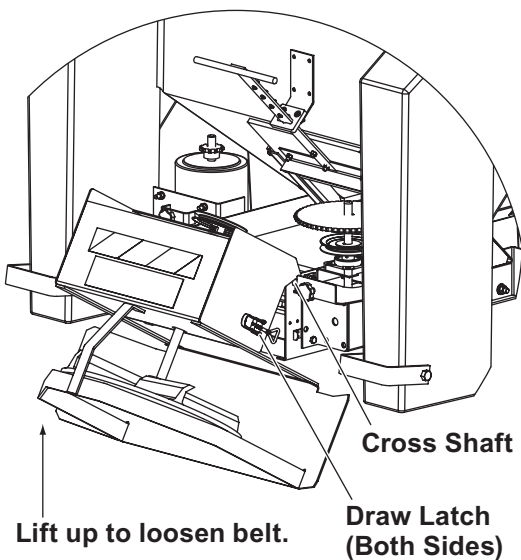
3. To lift the spreader into the truck bed from the ground, stand the spreader up on the feet at the rear of the spreader. The chute must be removed and the knobs that secure the chute cover screwed all the way in.



## MOUNTING THE SPREADER

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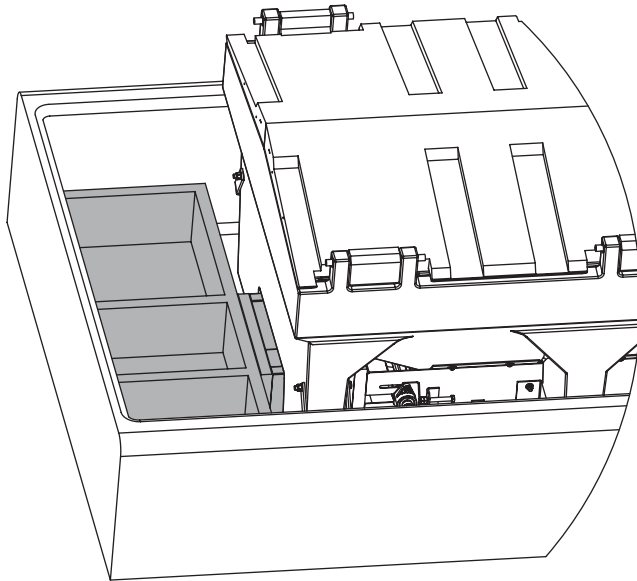
4. To remove the chute:
  - a. Release the two draw latches that hold the chute to the sill; rotate the bottom of the chute up to loosen the drive belt.
  - b. Remove the belt from the spinner shaft pulley and lift the chute off the cross shaft.
5. Position spreader on its feet at the rear of the truck.
6. Tip the spreader toward the truck until the sill rests on the rear edge of the truck bed.
7. Lift the rear of the spreader and slide it into the truck bed. Two or more people are recommended for this task.



8. Center the spreader in the truck.
9. To assemble the chute to the spreader:
  - a. Hook the chute hooks over the cross shaft.
  - b. Rotate the chute up, position the V-belt over the two pulleys.
  - c. Lower the chute and fasten it to the sill by connecting the draw latches. (Refer to the illustration in Step 4.)

## MOUNTING THE SPREADER

10. Install the spacer between the end of the sill and the front of the truck bed as shown. If you do not have a spacer, refer to the Installation Instructions to create one. ***Failure to install this spacer could result in damage to the spreader.***



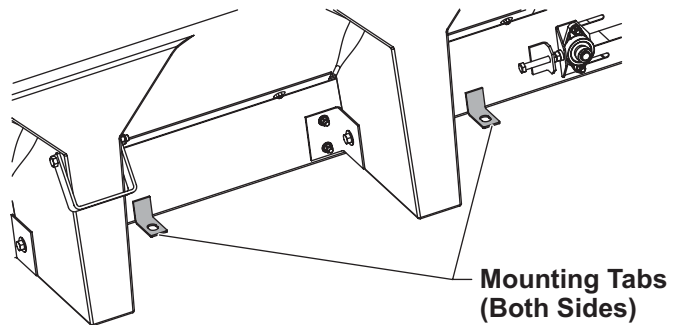
### ⚠ WARNING

Spreader shall be bolted to vehicle frame. Do not rely on the tie-down chains or straps alone to hold spreader in vehicle.

### ⚠ CAUTION

Before drilling any holes, check both sides of the material for any wires, fuel lines, fuel tanks, etc., that may be damaged by drilling.

11. Fasten the spreader to the truck bed using the mounting tabs and existing holes and hardware. If there are no holes, refer to the installation instructions.



**NOTE:** Pay special attention when drilling or clamping dissimilar metals to aluminum bodies. Galvanic corrosion can occur if not handled properly. Contact vehicle manufacturer for recommended attachment practices.

12. Install the chute cover prior to operating the spreader.

## OPERATING THE SPREADER – CAB CONTROL

### **⚠ WARNING**

Never operate equipment when under the influence of alcohol, drugs, or medications that might alter your judgment and/or reaction time.

### **⚠ WARNING**

Never exceed 45 mph (72 km/h) when loaded spreader is attached to vehicle. Braking distances may be increased and handling characteristics may be impaired at speeds above 45 mph (72 km/h).

### **⚠ WARNING**

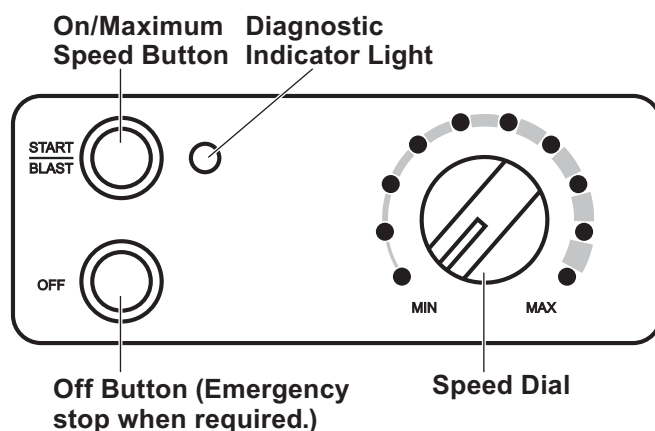
Never allow children to operate or climb on equipment.

### **⚠ WARNING**

Before starting the spreader, the driver shall verify that all bystanders are a minimum of 25 feet away from operating spreader.

## STARTING AND STOPPING MOTOR

1. To start the spreader, press the START/BLAST button and release. Both the START/BLAST and OFF buttons will be backlit when motor is running. Spreader will operate at speed selected on the speed dial.



2. Press the OFF button to stop motor. The OFF button operates as emergency stop when required.

**NOTE:** The truck ignition must be ON to start the spreader.

**NOTE:** If truck ignition is turned OFF while spreader is running, the motor will stop.

## ADJUSTING SPINNER/CONVEYOR SPEED

The speed setting can be adjusted when spreader is either ON or OFF.

1. Turn speed dial clockwise. Speed will increase as the number of green LEDs illuminated on speed dial increases.
2. Turning speed dial counterclockwise will decrease speed.

## Blast/Maximum Speed

1. Press and hold START/BLAST button as long as maximum speed is needed.
2. Release button when maximum speed is no longer needed. The control automatically returns to the "ON" position and the speed shown on the speed dial.

**NOTE:** When blast is used, the speed dial does not move to the maximum speed setting, but remains at the preset speed.

## OPERATING THE SPREADER – CAB CONTROL

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### DIAGNOSTIC INDICATOR LIGHT

The diagnostic indicator light located to the right of the START/BLAST button remains dark unless a problem with the motor or wiring is detected. The light will flash a number of flashes in a row, pause, then repeat. Count the flashes to determine the nature of the malfunction and refer to diagnostic chart below.

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**NOTE: Always place cover on the hopper to prevent moisture buildup. Do not let spreader sit idle with material in the hopper for an extended period of time. This can cause material to compact and reduce or stop the flow of material.**

---

# of Flashes	Problem	Possible Cause
0	No Fault	–
1	No Communication	Loss of communication between spreader module and cab control. Vehicle cable assembly is disconnected or faulty.
2	No Material Flow	Spreader is empty or material has bridged in the hopper.
3	Excess Current	Over 80 amps for 1–2 seconds. Conveyor belt is stalled.
4	No Power	Battery fuse is blown, or vehicle cable assembly is disconnected or faulty.
5	Over Heated	Motor is OFF due to spreader module over heating. Possibly due to excessive current draw or poor thermal contact between spreader module and conveyor sill.
6	Low Voltage	Low battery voltage or poor electrical connection of vehicle cable assembly.

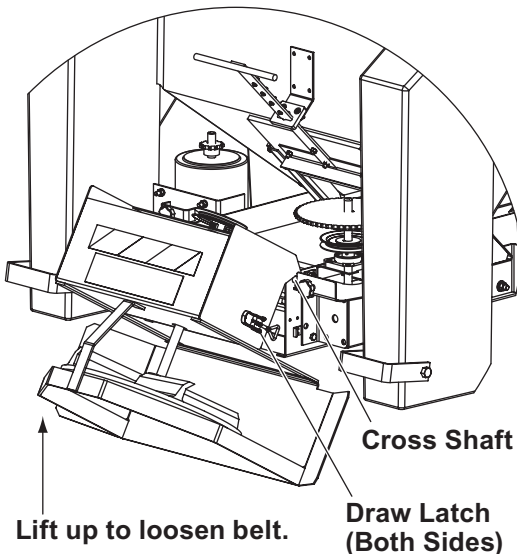


## REMOVING THE SPREADER

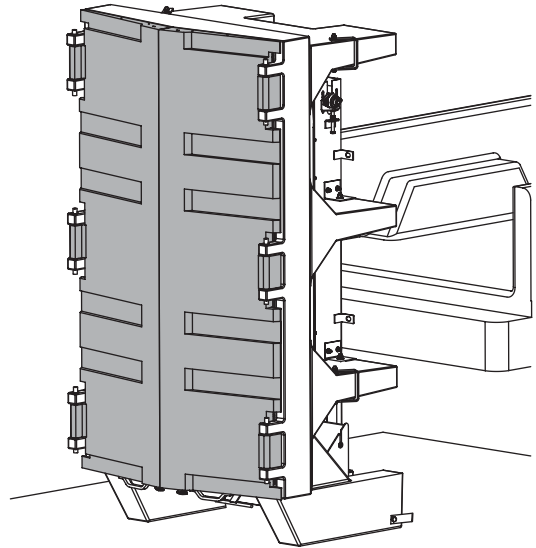
### **⚠ CAUTION**

**Before lifting, verify that hopper is empty of material. The lifting device must be able to support the spreader's weight as shown in the spreader specifications table.**

1. The spreader can be removed from the truck bed either by lifting the spreader by the four lifting handles located on the corner legs or by sliding the spreader out of the truck bed onto the ground.
2. To remove the spreader from the truck without a lifting device, first make sure all material has been removed from the spreader. To empty the spreader:
  - a. Remove the chute cover.
  - b. Remove the chute by releasing the two draw latches that hold the chute to the sill; rotate the bottom of the chute up to loosen the drive belt. Remove the belt from the spinner shaft pulley and lift the chute off the cross shaft.
3. Disconnect the electrical connections at the spreader and remove the chute cover. The knobs that secure the chute cover must be screwed all the way in.
4. Remove any means used to attach the spreader to the truck bed and ensure the lids are closed securely.
5. To remove the spreader without a lifting device, two or more people are recommended. Move spreader rearward until it balances at the rear of the bed. Carefully lower the back of the spreader to the ground so it is resting on its feet.
6. Tip the spreader up so it is fully supported by the feet.



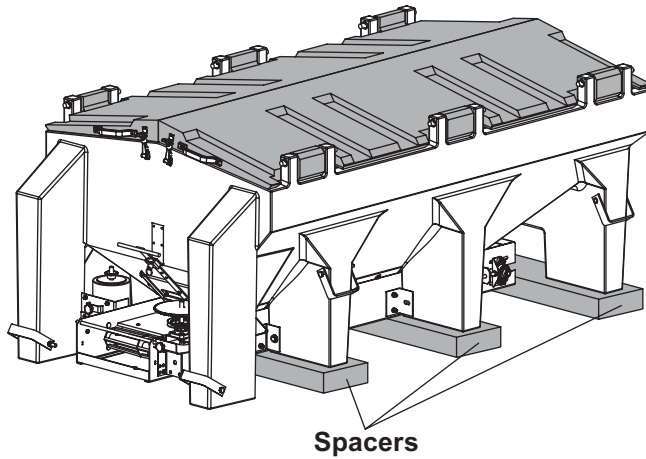
- c. Reinstall the chute cover and operate the hopper to convey all material from the spreader.



## REMOVING THE SPREADER

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7. **Do not leave an unsecured spreader standing on its feet.** After pulling the truck away, either lower the spreader so it is resting on its 6 legs or properly support it with blocks and secure it as directed in the Storage section. If lowering the spreader onto its 6 legs, place spacers under the legs so the feet at the rear of the spreader are off the ground.



# MAINTENANCE

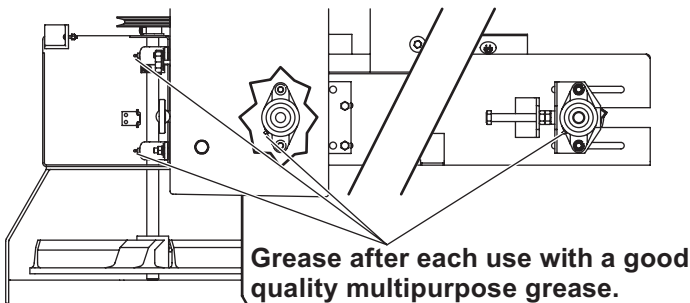
## ⚠ CAUTION

Disconnect electric power at spreader electrical wiring harness connection and tag out if required before servicing or performing maintenance.

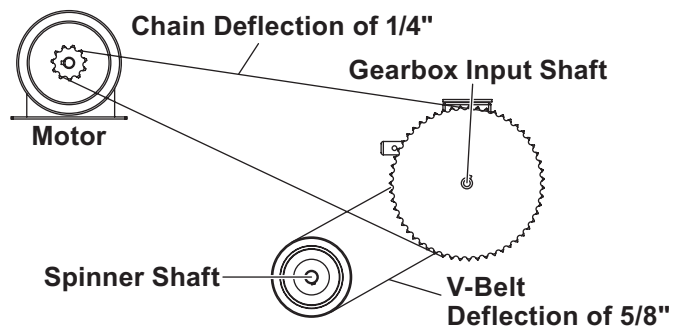
## GREASE FITTINGS

To keep your spreader running smoothly, observe the following recommendations:

- Lubricate grease fittings after each use and at the end of each season.



## DRIVE BELT AND CHAIN TENSION



### To adjust belt tension:

1. Loosen the carriage bolts that hold the spinner shaft.
2. Slide the spinner shaft to increase/decrease tension.
3. After adjusting the shaft, tighten the carriage bolts. Belt should deflect 5/8" between the pulleys.

### To adjust the chain tension:

1. Loosen the bolts that hold the motor.
2. Slide the motor to increase or decrease the chain tension.
3. After adjusting the motor, tighten the bolts. The chain should deflect 1/4" between the sprockets.

**NOTE: Overtightening the belt or chain may result in damage to the motor or gear box bearing.**

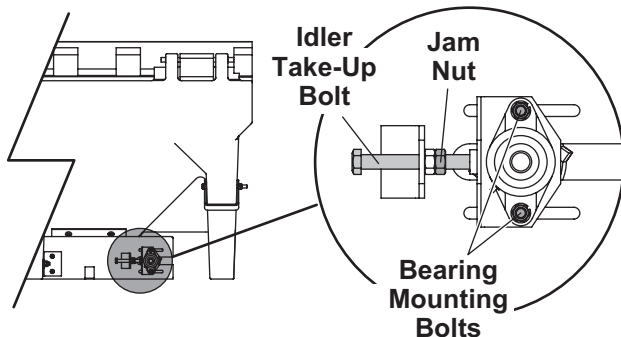
## CONVEYOR BELT TENSION

The conveyor drive roller can slip inside the conveyor belt for a number of reasons, including (1) material trapped/frozen between the conveyor belt and the vehicle bed surface, (2) frozen material in the hopper and (3) improper belt tension. Before adjusting conveyor belt tension, verify that material is not trapped/frozen between the conveyor belt and the vehicle bed surface and that frozen material is not preventing the belt from operating properly. In either of these situations, either the drive roller will slip or the spreader control will sense an overload and will shut down, signified by the diagnostic indicator light flashing three times. See Operating the Spreader – Cab Control section for details on the control and the diagnostic indicator light.

1. Fully load the hopper with the material that will be regularly used.
2. Briefly test the spreader. If the drive roller slips inside the conveyor belt or the conveyor belt does not move, immediately turn the spreader OFF. If the drive roller is not slipping and the conveyor belt is moving, the conveyor belt tension is correct.

**NOTE: Stop the spreader immediately if the drive roller is slipping inside the conveyor belt. Running the spreader when the drive roller is slipping can damage the conveyor belt.**

3. Loosen the two bearing mounting bolts on each side of the conveyor idler roller.



4. Loosen the jam nut on one of the take-up bolts, then tighten (clockwise) the take-up bolt one full revolution. Repeat evenly on the other side.
5. Start the unit to determine if conveyor tension is correct. If tension is not enough to restart the load or if the conveyor drive roller slips, immediately turn the spreader OFF and repeat the steps above until the load restarts and the conveyor drive roller does not slip.
6. Run the load for a few minutes and check the conveyor idler pulley to determine if the conveyor belt is running closer to one side than the other. If the belt tracking is centered and the belt is not rubbing on the side of the sills, retighten the jam nuts and the bearing mounting bolts on both sides of the conveyor idler roller.
7. If the conveyor belt is tracking off center, tighten the take-up bolt on the side that the belt is tracking towards. Sometimes it is necessary to overtighten this side to make the belt track back toward center, then loosen the take-up bolt slightly to maintain center tracking of the belt. Once the belt tracking is centered and the belt is not rubbing on the side of the sills, retighten the jam nuts and the bearing mounting bolts on both sides of the conveyor idler roller.

**NOTE: The conveyor belt may relax or stretch after the first few loads of material and may require readjustment. Check belt tension after the first few loads and adjust as necessary.**

# MAINTENANCE

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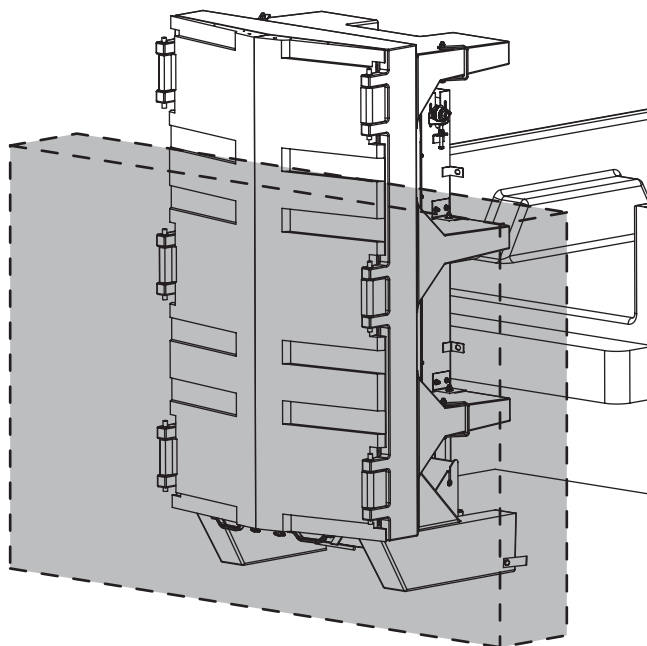
## AFTER EACH USE

- Wash out the hopper and rinse off all external surfaces.
- Clean out any trapped/frozen material from between the conveyor belt and the vehicle bed surface.
- Apply dielectric grease on all electrical connections to prevent corrosion at the beginning and end of the season and after each use.
- Lubricate all grease fittings with good quality multipurpose grease.

## STORAGE

The spreader can be stored on end (on its feet) for storage; however, steps must be taken to properly secure it.

1. Back the truck near a wall, fence, or other permanent structure so that there is enough room to remove the spreader but the spreader will be against the structure when it is taken out of the truck.
2. Remove the spreader from the truck following the instructions in this manual.
3. Secure the spreader to the structure using chains or straps to ensure that it cannot tip or fall.



## MAINTENANCE

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### AT THE END OF EACH SEASON OR AFTER EXTENDED STORAGE

- Wash out the hopper and rinse off all external surfaces.
- Apply dielectric grease on all electrical connections to prevent corrosion.
- Lubricate all grease fittings with good quality multipurpose grease.
- Oil or paint all bare metal surfaces.

### FUSE REPLACEMENT

See the Harness Wiring Diagram for fuse locations.

If a problem should occur and fuse replacement is necessary, the replacement fuse must be of the same type and amperage rating as the original. Installing a fuse with a higher rating can damage the system and could start a fire.

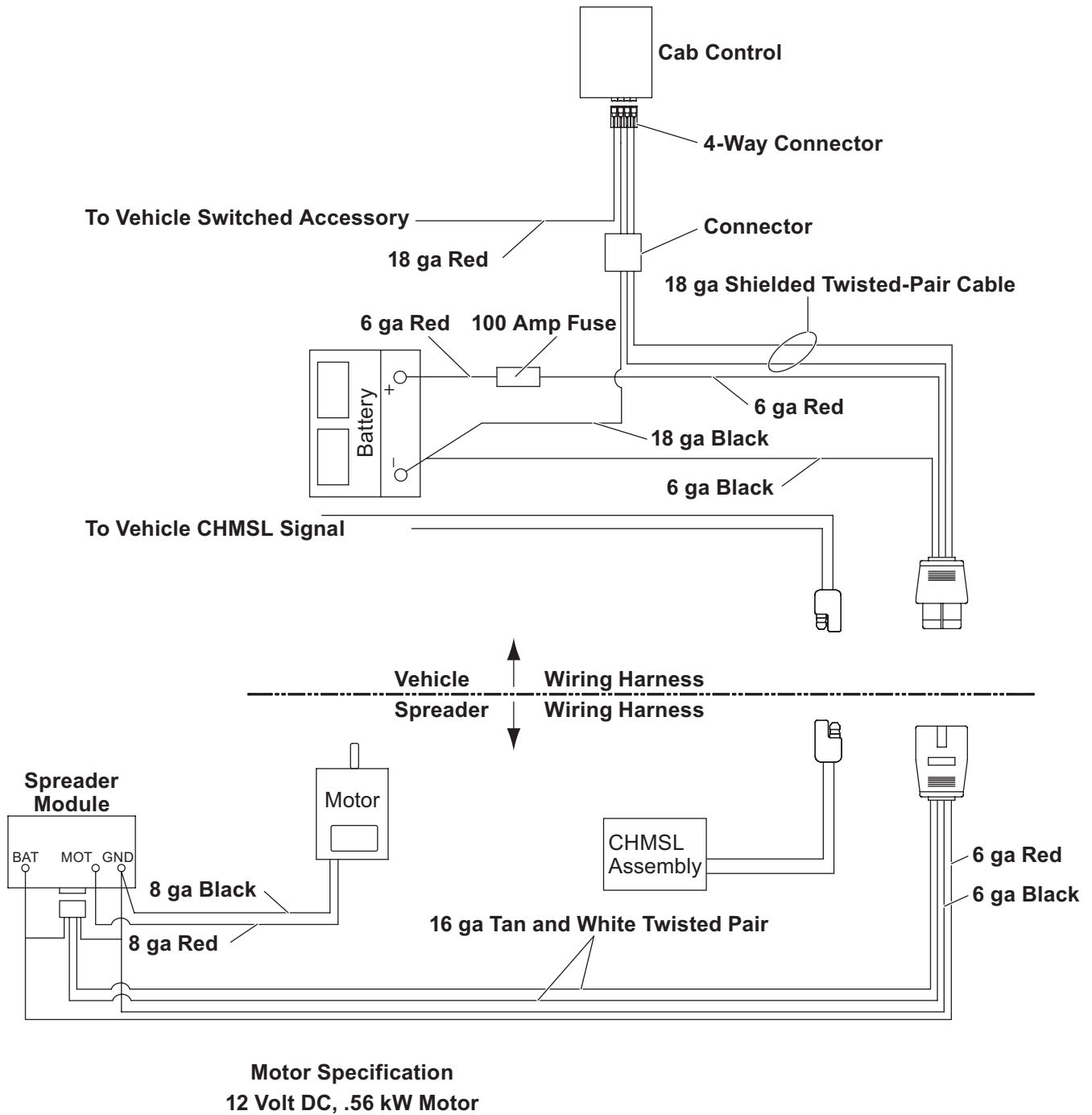
### RECYCLE

When your spreader has performed its useful life, many of its components can be recycled as steel. Gear oil shall be disposed of according to local regulations. Balance of parts made of plastic shall be disposed of in customary manner.

### GEAR OIL SPECIFICATION

Use Mobil SHC 632 or Exxon SHP 320 or equivalent.

# HARNESS WIRING DIAGRAM



# TROUBLESHOOTING GUIDE

Please see your distributor for service. The troubleshooting reference table below may guide you in diagnosing the issue.

For a reference table of the cab control error codes, see the "Operating the Spreader – Cab Control" section of this manual.

Before servicing the spreader:

- Review all safety information.
- Confirm that all electrical connections are tight and clean.
- Confirm that nothing is jammed in the hopper.

Problem	Possible Cause	Suggested Solution
<b>No power to cab control.</b> Ignition and control switches ON; no illumination of indicator light(s).	1. Control connector plug is loose.	1. Check plug connection at cab control.
	2. Switched accessory connection is poor or faulty battery.	2a. Check for low battery. 2b. Check switched accessory connection.
	3. Vehicle control harness is damaged.	3. Repair or replace damaged wires or harness as required.
<b>Speed control dial does not change motor speed.</b>	1. Malfunctioning cab control.	1. Replace cab control.
	2. Malfunctioning spreader module.	2. Replace spreader module.
<b>Spreader does not operate.</b> Indicator light(s) illuminated.	1. Overloaded condition is causing over-current protection to activate.	1. Reset cab control by turning the power OFF. Depress the START/BLAST switch to resume operation.
	2. Wire harness is damaged or has an open circuit between cab control and spreader.	2a. Check plug connections at cab control and spreader. 2b. Check wire connections at spreader motor and at vehicle battery – disconnect motor leads, turn control on, set cab control to maximum on variable speed controls and check for voltage at motor leads. 2c. Repair or replace damaged wires and connectors. 2d. Check the 100 amp in-line fuse. Replace if necessary.
	3. Spreader motor is not running when power and ground are applied.	3a. Replace motor if shaft will not turn. 3b. Remove and inspect both motor brushes. Replace if worn.
	<b>Unplug the spreader harness and tag out, if required, before performing any of the following repairs.</b>	
	1. Obstruction is preventing rotation.	1. Clear obstruction.
<b>Spinner does not turn.</b> Motor is running.	2. Drive belt is loose or damaged.	2. Adjust the tension or replace the belt if worn or damaged.
	3. Motor sprocket is not secured to motor shaft.	3. Tighten the pulley set screw or replace the pulley if damaged.
	4. Spinner pulley is not secured to spinner shaft.	4. Replace cap screw and nut if missing or damaged. Replace pulley if damaged.
	5. Spinner shaft bearings are dry or seized.	5. Grease or replace bearings.
	6. Gear box sprocket or pulley is not secured to gear box shaft.	6. Tighten set screws or replace sprocket or pulley if damaged.



## TROUBLESHOOTING GUIDE

Problem	Possible Cause	Suggested Solution
<b>Conveyor chain not moving.</b> Spinner is turning.	<b>Unplug the spreader harness and tag out, if required, before performing any of the following repairs.</b>	
	1. Obstruction is preventing rotation.	1. Clear obstruction.
	2. Sprocket is not secured to motor shaft.	2. Replace set screw if missing or damaged. Replace sprocket if damaged.
	3. Sprocket is not secured to gear box shaft.	3. Replace damaged or missing key. Replace sprocket if damaged.
	4. Gear box is damaged.	4. Replace gear box if output shaft does not turn when input shaft turns.
	5. Conveyor rollers are not secured to shafts.	5. Replace missing cap screws and nuts. Replace shafts or rollers if damaged.
	6. Conveyor belt is loose or damaged.	6. Adjust belt tension. Replace belt if damaged.
	7. Conveyor belt is not aligned.	7. Align belt to ride centered on rollers.
	8. Conveyor belt shaft bearings are seized or otherwise damaged.	8. Grease or replace bearings.
<b>Material in hopper does not flow.</b> Conveyor belt and spinner are moving.	<b>Unplug the spreader harness and tag out, if required, before performing any of the following repairs.</b>	
	1. Feed gate is closed.	1. Open feed gate fully, then adjust to desired opening size.
	2. Obstruction in hopper.	2. Clear obstruction.
	3. Material bridged.	3. Clear the bridge.

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Western Products  
PO Box 245038  
Milwaukee, WI 53224-9538  
[www.westernplows.com](http://www.westernplows.com)

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